

1. The road should be widened toward the side opposite of Bird Branch between stations 15+00 and 18+50 and the wetland area between stations 47+00 and 49+00 as we discussed in our site visit on August 15, 1997.
2. Stringent sedimentation and erosion control measures should be implemented and maintained on the project site to avoid impacts to downstream aquatic resources. Temporary or permanent herbaceous vegetation should be planted on all bare soil within 15 days of ground disturbing activities to provide long-term erosion control.
3. Culverts should be placed with the floor of the barrels approximately one foot below the level of the stream bottom to allow natural stream bottom materials to become established in the culvert following installation. This may require increasing the size of the culvert to meet flow conveyance requirements.
4. Under no circumstances should rock, sand, or other materials be dredged from the wetted stream channel under authorization of this permit, except in the immediate vicinity of the culverts. Instream dredging has catastrophic effects on aquatic life, and disturbance of the natural form of the stream channel will likely cause downstream erosion problems, possibly affecting other land owners.
5. If possible, excavation of the stream crossings should be conducted in the dry. Sand bags, cofferdams, flexible pipe, or other diversion structures should be used to minimize excavation in flowing water.
6. If concrete is used during culvert installation (headwalls), a dry work area should be maintained to prevent direct contact between curing concrete and stream water. Uncured concrete affects water quality and is toxic to fish and other organisms.
7. Stormwater should be directed to buffer areas or retention basins and should not be routed directly into streams or the Little Tennessee River. Sediment basins should be constructed in all ditch lines at culvert inlets to prevent sediments and other contaminants from entering surface waters. This is extremely important at culverts which empty directly into the Little Tennessee River. Structures should be inspected and maintained regularly, especially following rainfall events.
8. Rock check dams at culvert outlets in "live streams" should be removed once the project is stabilized.
9. Riparian vegetation should be preserved as much as possible. If overhanging trees must be removed, they should be cut near ground level, leaving the stump and roots in the bank for stability and to possibly sprout. Where practical, riprap should be kept to a minimum so as to retain riparian vegetation, which we prefer for bank stabilization.
10. All culvert installations should be conducted between April 15 and January 1 to avoid impacts on trout reproduction.
11. All mechanized equipment operated near surface waters should be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials.